WHAT IS CLAIMED IS:

1.   A method for dynamically mixing header suppression techniques transmitted over a DOCSIS network, comprising the steps of:

(a)   communicating a plurality of suppression techniques and one or more index numbers assigned to each one of the plurality of suppression techniques to a cable modem termination system;

(b)   receiving a plurality of data packets to be transmitted;

(c)   identifying which of the received data packets should be suppressed;

(d)   selecting a header suppression technique for each of the identified data packets;

(e)   appending a packet header element to each of the identified data packets, the packet header element containing the index number assigned to the header suppression technique selected for each of the identified data packets; and

(f)   suppressing each of the identified data packets using the header suppression technique selected for each of the identified data packets.

2.   The method of claim 1, further comprising the steps of:

(g)   concatenating each data packet within a single DOCSIS transmit burst to form a mixed protocol SID; and

(h)   transmitting the mixed protocol SID to a cable modem termination system.

3.   The method of claim 1, wherein each of the received data packets that are unknown IP packets are identified for suppression in said identifying step (c).

4.   The method of claim 3, wherein DOCSIS protocol header suppression is selected in said selecting step (d) for each of the received data packets that are unknown IP packets.

5.   The method of claim 1, wherein each of the received data packets that are IP/RTP packets with dynamically changing patterns are identified for suppression in said identifying step (c).

6.   The method of claim 5 wherein RTP suppression is selected in said selecting step (d) for each of the received data packets that are IP/RTP packets with dynamically changing patterns.

7.   The method of claim 1, wherein each of the received data packets that are IP/TCP variable length packets are identified for suppression in said identifying step (c).

8.   The method of claim 7, wherein dynamic delta encoding suppression is selected in said selecting step (d) for each of the received data packets that are IP/TCP variable length packets.

9.   A method for expanding data packet headers transmitted over a DOCSIS network, comprising the steps of:

(a)   receiving a mixed protocol SID comprised of one or more data packets suppressed in accordance with a selected header suppression technique;

(b)   identifying each data packet within the mixed protocol SID that is suppressed;

(c)   searching a lookup table to identify a set of rules for expanding the data packets identified in step (b); and

(d)   expanding each suppressed data packet according to the set of rules identified in step (c).

10.   The method of claim 9, wherein each data packet identified in said identifying step (b) has an appended packet header element containing an index number.

11.   The method of claim 10, wherein said searching step (c) uses the index numbers contained in each appended packet header element to search the lookup table.

12.   The method of claim 11, wherein DOCSIS protocol header expansion rules are used in said expanding step (d) for each of the received data packets that are unknown IP packets.

13.   The method of claim 11 wherein RTP expansion rules are used in said expanding step (d) for each of the received data packets that are IP/RTP packets with dynamically changing patterns.

14.   The method of claim 11, wherein dynamic delta encoding expansion rules are used in said expanding step (d) for each of the received data packets that are IP/TCP variable length packets.

15.   A system for dynamically mixing header suppression techniques transmitted over a DOCSIS network, comprising:

one or more cable modems that suppress data packets using one of a plurality of header suppression techniques; and

a cable modem termination system (CMTS) enabled to expand said data packets using said one of said plurality of suppression techniques, wherein said one or more cable modems assigns one or more index numbers to each one of said plurality of suppression techniques.

16. The system of claim 15, wherein said one or more cable modems appends a packet header element to each data packet it suppresses, wherein said packet header element includes said one or more index numbers assigned to the header suppression technique used to suppress each data packet.

17. The system of claim 16, wherein said one or more cable modems concatenates each data packet it suppresses into a single DOCSIS transmit burst to form a mixed protocol SID.